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any convenient shape fitted with a two-holed rubber stopper through which are inserted two glass tubes of 5 mm. bore, one projecting 5 cm. and the other 2.5 cm. from the stopper.

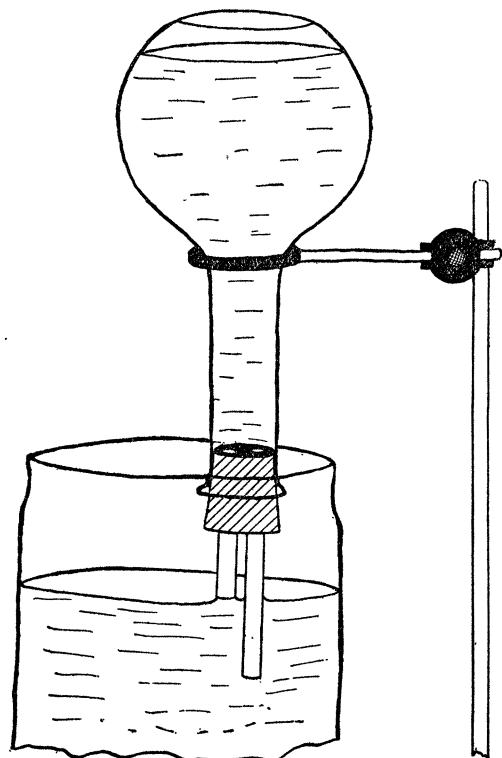


FIG. 1.

The operation of the apparatus is as follows: the flask is filled with the nutrient solution which is used in the culture jar and inverted above it (or the glass tubes can be bent so that the flask is above and at one side of the jar, and thus out of the way of the plants). The solution flows out of the longer tube, the shorter tube allowing the ingress of air. This flow of solution from the longer tube may be stopped by lowering the flask until the end of the shorter tube comes in contact with the solution in the culture jar, which seals the end of this tube and prevents the entrance of air and thus the exit of solution from the longer tube. The flask is adjusted so that the lower end of the shorter tube is at a level desired as the constant one, and as soon as the solution sinks

(about 1.5 mm.) below this level either from evaporation or the taking up of the solution by the plant the air enters through the lower end of the shorter tube, allowing the exit of solution through the longer tube until the level of solution in the culture jar rises to the end of the shorter tube, which is sealed until the water level sinks again. In the case of culture experiments where the mouth of the culture jar is covered it is only necessary to bore two holes to admit the two tubes projecting from the reservoir.

ORTON L. CLARK

MASSACHUSETTS AGRICULTURAL EXPERIMENT  
STATION

### SOCIETIES AND ACADEMIES

#### THE BOTANICAL SOCIETY OF WASHINGTON

THE 112th regular meeting of the Botanical Society of Washington was held in the Assembly Hall of the Cosmos Club, Tuesday, April 4, 1916. Fifty-two members and five guests were present. Harry R. Fulton, George L. Keenan, Lester A. Round, J. F. Clevenger, C. E. Temple, A. E. Aldous, Victor Birekner and Forrest S. Holmes were elected to membership. The following papers were presented:

*Botanical Explorations in South America:* DR. J. N. ROSE.

*Plants Domesticated in Peru:* MR. O. F. COOK.

Mr. Cook gave a brief account of the agriculture of the Incas with their wonderful terraces and system of irrigation. Among the plants domesticated by them were maize, beans, lima beans, peanuts, quinoa (*Chenopodium quinoa*), red peppers (*Capsicum*), mandioca, tomatoes, passion fruits, sweet potatoes, tuberous *Tropaeolum* and *Oxalis*, arracacha (a celery-like plant), squashes and pumpkins, gourds; and among the fruits, chirimoyas, lucumas and pepinos. The narcotic coca, from which cocaine is now prepared, was also grown. Mr. Cook's paper will be embodied in a forthcoming article in the *National Geographic Magazine* for May, 1916.

THE 113th regular meeting of the Society was held in the Assembly Hall of the Cosmos Club, Tuesday, May 2, 1916. Mr. Frank N. Meyer, geographical explorer of the U. S. Department of Agriculture, was elected to membership. The program consisted of the following papers:

*Dr. Edward L. Greene, an Appreciation:* H. H. BARTLETT.

As it was impossible for Mr. Bartlett to be pres-

ent at the meeting, the paper was read by title. It appeared in full in *Torreyia* for July, 1916.

*Winter Rape and Adulterants of This Seed* (with lantern): EDGAR BROWN.

Five types of plants raised from seed imported into the United States under the name of rape were briefly described and illustrated. The Dutch and German sources of the winter rape seed normally used in this country for the production of forage having been shut off, seed was imported from other sources, including winter rape from England, France and Japan, annuals of no forage value from Argentina, France, China and Japan, and biennials of no forage value from France and Japan.

*An Economic Amaranthus of Ancient America* (with exhibition of specimens and lantern): W. E. SAFFORD.

Among the tributes paid to Montezuma by the pueblos of Mexico was a certain grain of ivory whiteness and more minute than a mustard seed, called by the Aztecs *huauhtli*. Eighteen imperial granaries were filled with it each year, each having a capacity of about 9,000 bushels. In some parts of Mexico, at times when maize was scarce, this seed was used in its stead and along the Pacific coast it was an important food staple. Cabeza de Vaca noticed it in Sonora in 1536. Its most important use was in religious ceremonies, when a paste, called *tzoalli*, was made of it together with maguey syrup, and images of the god Uitzilipuztli were molded of it. After having been adorned with beautiful ornaments and carried in procession, the image was carried to the top of the pyramidal temple in the city of Mexico. Sacrifices were made to it, including human beings, and the next day it was broken up into fragments and served as communion to the people. For a long time the botanical identity of this seed was unknown. The late Edward Palmer while making collections in the states of Sinaloa and Jalisco, found an *Amaranthus* growing both in cultivation and spontaneously. Its ivory-white seeds, resembling fish-eggs, corresponded exactly with the *huauhtli* as described by early writers. Moreover, its local name, "guaute," is only a variation of the Nahuatl *huauhtli*. Near Guadalajara Dr. Palmer found a paste made of this seed and sugar offered for sale in the form of strings of dumplings enveloped in corn husks, under the name of "suale," a corruption of the Nahuatl *tzoalli*. He collected botanical specimens of the plant producing the seed, which proved to be an *Amaranthus*, evidently a white-seeded form of *A. paniculatus*.

Although Dr. Palmer did not realize that he had rediscovered an important economic plant of the Aztecs, his botanical specimens together with his field notes, found by the writer in the U. S. National Herbarium, served to establish the identity of the sacred *huauhtli*. The possibility of cultivating this *Amaranthus* in suitable situations in the southwestern United States was suggested by the writer. Very closely allied plants, also producing white seeds, are cultivated as grain crops in India, Thibet, South America and Africa. Of the existence of this particular form in pre-Columbian America there can be no doubt. It remains to be determined whether or not the Asiatic and African plants were endemic in the countries where they are now cultivated, or were introduced there after the discovery of America. Mr. Safford's paper will appear in full in the Proceedings of the Ninth Congress of Americanists.

*Fungus Fairy Rings in Eastern Colorado and Their Effect on Vegetation* (with lantern): H. L. SHANTZ AND R. L. PIEMEISEL. To be published by the U. S. Department of Agriculture.

*Report on the Local Flora*: A. S. HITCHCOCK.

W. E. SAFFORD,  
Corresponding Secretary

#### THE SOUTH DAKOTA ACADEMY OF SCIENCE

THE second annual meeting of the South Dakota Academy of Science was held in Watertown, South Dakota, November 27 and 28. The following papers were read:

President's address, H. I. Jones.

"The Locust Outbreak in South Dakota in 1916," by H. C. Severin and Geo. Gilbertson.

"Water Culture," R. J. Gilmore.

"The Plankton of the James River," W. H. Griffith.

"Soil Fertility in South Dakota," J. G. Hutton.

"A Study of Lipase," H. I. Jones.

"Aluminum Phenolate," A. N. Cook and G. N. Quam.

"The Chemistry of the Cell," J. M. Scott.

"Correlation in Corn," A. N. Hume.

"Notes on Sodium Cyanide," W. J. Sharwood.

The officers for 1916-17 will be:

President, A. N. Cook, Vermillion.

First Vice-president, A. N. Hume, Brookings.

Second Vice-president, L. G. Atherton, Madison.

Secretary, R. J. Gilmore, Huron.

Treasurer, H. Loomis, Brookings.

The next meeting will be held at Brookings in October, 1917.

R. J. GILMORE,  
Secretary